

East Side Tunnel
Through Piegan Mtn., on Going-to-the-Sun Road
Glacier National Park
Flathead County
Montana

HAER No. MT-80

HAER
MONT,
15-WEGLA,
16-

PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, DC 20013-7127

HISTORIC AMERICAN ENGINEERING RECORD

EAST SIDE TUNNEL
HAER MT-80

HAER
MONT,
15- WEGLA,
16-

Location: Through Piegan Mountain, on Going-to-the-Sun Road, approximately thirty-four miles northeast of the park entrance at West Glacier, Glacier National Park, Glacier County, Montana
UTM: Logan Pass Quad. 12/301700/5397050

Date of
Construction: 1931

Structural Type: Mountain tunnel through natural stone

Contractor: Colonial Building Co., Spokane, Washington

Subcontractor: Ed Holm & Co., Spokane, Washington

Engineer: Bureau of Public Roads

Owner: Glacier National Park

Use: Vehicular mountain tunnel

Significance: The East Side Tunnel is one of approximately seventeen prominent masonry and concrete structures on Going-to-the-Sun Road in Glacier National Park. The 51-mile stretch of scenic road is significant as a unique engineering accomplishment of the early twentieth century, and as the first product of a 1925 cooperative agreement between the National Park Service and the Bureau of Public Roads. The East Side Tunnel is unique in that its construction was heavily dependent upon hand labor, unlike the majority of other structures on the road.

Project
Information: Documentation of the East Side Tunnel is part of the Going-to-the-Sun Recording Project, conducted during the summer of 1990 under the co-sponsorship of HABS/HAER and Glacier National Park. Researched and written by Kathryn Steen, HAER Historian, 1990. Edited and transmitted by Lola Bennett, HAER Historian, 1992.

Going-to-the-Sun Road

The East Side Tunnel is a 408-foot tunnel that carries Going-to-the-Sun Road through Piegan Mountain in Glacier National Park. Going-to-the-Sun Road is a scenic park road that winds through the spectacular mountains and valleys in the middle of the park. The 51-mile road, built in sections between 1911 and 1933, and rebuilt during the next two decades, runs east and west through the park. Starting in the west, the road runs from West Glacier, along the 10-mile eastern shore of Lake McDonald and then up McDonald Creek for an additional ten miles. About one mile beyond the junction with Logan Creek, the road begins its ascent to Logan Pass. The road climbs at a 6-percent grade, passes through a tunnel, and turns at a major switchback called "The Loop." Following the contours of the sides of Haystack Butte and Pollock Mountain, the road passes over several bridges, culverts, and retaining walls before reaching Logan Pass. The road descends to the east along the sides of Piegan Mountain and Going-to-the-Sun Mountain before running along the north shore of St. Mary Lake. The road exits the park as it crosses Divide Creek near St. Mary, Montana.¹

Significance of the Road

Going-to-the-Sun Road is significant as an outstanding engineering feat of the early twentieth century. In addition, the road was the first product of the interagency cooperative agreement between the National Park Service (NPS) and the Bureau of Public Roads (BPR). The agreement, signed in 1925, allowed the National Park Service to utilize the roadbuilding expertise of the Bureau of Public Roads while still retaining control to protect the landscape.²

East Side Tunnel

By 1930, all of Going-to-the-Sun Road had been constructed except for the ten miles east of Logan Pass. During 1929 and 1930, A.V. Emery, the BPR's resident engineer, did the final surveying on the east side in preparation for letting out the contracts. The NPS and BPR divided the ten miles into two contracts and the Colonial Building Company of Spokane, Washington, won the contract for the 5½-mile section of road that ran from Logan Pass to Going-to-the-Sun Mountain. The contractors opted to subcontract the tunnel to Ed Holm and Company of Spokane and during the season of 1931, the subcontractor bored through the mountainside.³

The tunnel was the most difficult feature on Colonial's 5½ miles. Since there was no completed road for five miles east of Colonial's contract, the contractor looked to Logan Pass and its route from the west to provide access for the heavy equipment. However, the equipment could only proceed a mile into the contract from Logan Pass until the tunnel was complete. This made construction of the tunnel an immediate priority.⁴

Colonial's contract included sheer cliffs along Piegan Mountain that made access to the tunnel a problem. In addition, blasting on the cliffs would obliterate a horse trail below the road. The park had a policy

requiring the contractor to replace or realign any trails interrupted by the road's construction. As Colonial's first project, they had subcontractors Nick Scoff and Company build a new trail about 200' above the road from Logan Pass to the Piegan Pass Trail. This trail could accommodate the horse traffic, but more importantly to the progress of the road, the trail served as Colonial's supply route.⁵

Colonial's tunnel subcontractors, Ed Holm and Company, established a small supply center on the trail directly above the tunnel. In late July, 1931, Holm built a blasting house and a platform to hold two compressors. A Caterpillar tractor delivered supplies to the site on the trail, but laborers carried the supplies--primarily explosives--down a steep trail for 300' and then down two long ladders for a direct 100-foot descent to the tunnel's east portal.⁶

At the east portal, the subcontractors first blasted out a ledge or bench on which to stand, and then began tunneling their way west through the rock. On the east portal, Holm worked his laborers two to three shifts to get the tunnel open before winter. Holm concentrated primarily on the east portal--where he could progress 5'-4" every twenty-four hours. He used an average of 2.46 pounds of dynamite per cubic yard of rock, moving 111 cubic yards per blast or about 6½' further into the tunnel with each blast. Holm used only one shift on the west portal and they averaged just 1' per day.⁷

After a blast, the laborers loaded the rock by hand into small carts on rails and wheeled the carts outside where they dumped the contents over the side of the road. The loaded carts rolled more easily out the east portal since the tunnel declined toward the east at a 4-percent grade. The compressors up above the tunnel provided compressed air to run the jackhammers. Holm also pumped water down to the tunnel from above. The subcontractor did no ventilating and relied on natural draft to clear the fumes after a blast.⁸

Ed Holm and Company holed through the tunnel October 19 and had completed the majority of his work before winter closed down operations five days later. At the time of construction, the tunnel was 26' wide, 19'-9" tall, and 405' long.

In 1941 and 1942, the BPR and NPS arranged additional work on the tunnel. The tunnel suffered from water leakages and Elmer Genger and Sons of Fairfield, Montana, won the contract to place a 12-inch reinforced concrete lining inside the tunnel. For pouring the concrete, the contractor built a large arched wooden framework in Fairfield and transported it to the tunnel. In addition to the lining, Genger also built the masonry portals.⁹

Description

The East Side Tunnel is 408' long, 18'-4" high, and 25' wide at the base. The roadway is 22' wide, with 1'-6" curbs on either side. Drainage pipes run underneath the curbs. There is very little masonry at the western portal--just seven blocks of stone to cover the concrete lining, but the eastern portal has masonry along the top and southern edges. There is some cracking and calcium build-up on the inside of the tunnel lining. The road surface is also concrete.

ENDNOTES

1. See the Historic American Engineering Record report HAER MT-67 on the Going-to-the-Sun Road.

2. C.H. Purcell, F.A. Kittredge, J.A. Elliott, T.C. Vint, and C.J. Kraebel, Suggested Procedure for Cooperation Between the National Park Service and the Bureau of Public Roads in Major Traffic-Way Projects Within the National Parks, April 22, 1925 (Record Group 79, National Archives, Washington, D.C.)

3. Walter A. Averill, "Benching the Transmountain Highway from Solid Rock Cliffs in Glacier National Park," Pacific Builder and Engineer (May 7, 1932), pp. 24-25; R.E. McMullen, "Tunnel Construction on the Transmountain Highway," Pacific Builder and Engineer (May 7, 1932), p. 29.

4. McMullen, p. 29.

5. McMullen, p. 29.

6. McMullen, p. 29; Averill, p. 24-25.

7. McMullen, p. 30.

8. McMullen, p. 30.

9. John Zoss, "Final Construction Report on Glacier National Park Transmountain Highway, East Side, Project 1-D2, Tunnel Lining, Paving and Portals," February 22, 1943. The final construction report belongs to the Glacier National Park Library Historical Files.

BIBLIOGRAPHY

- Averill, Walter A. "Benching the Transmountain Highway from solid Rock Cliffs in Glacier National Park," Pacific Builder and Engineer May 7, 1932, pp. 24-28.
- Historic American Engineering Record. "HAER MT-67: Going-to-the-Sun Road." (Library of Congress, Washington, D.C.)
- McMullen, R.E. "Benching the Transmountain Highway from Solid Rock Cliffs in Glacier National Park," Pacific Builder and Engineer May 7, 1932, pp. 29-30.
- Purcell, C.H., F.A. Kittredge, J.A. Elliott, T.C. Vint, and C.J. Kraebel. Suggested Procedure for Cooperation Between the National Park Service and the Bureau of Public Roads in Major Traffic-Way Projects Within the National Parks. April 22, 1925 (Record Group 79, National Archives, Washington, D.C.)
- Zoss, John. "Final Construction Report on Glacier National Park Transmountain Highway, East Side, Project 1-D2, Tunnel Lining, Paving and Portals." February 22, 1943 (Glacier National Park Library Historical File).